

EVOLUTIONARY AND SYSTEMATIC SIGNIFICANCE OF HYBRIDIZATION IN MEDITERRANEAN SEDOIDEAE (CRASSULACEAE)

HENK 't HART

The extreme variation in chromosome numbers found in the subfamily *Sedoideae* Berger of the *Crassulaceae* ('t Hart, 1991, 1995), in particular the frequent occurrence of high, secondary basic chromosome numbers ($x=14$ and higher numbers; GRANT, 1971), strongly suggests reticulate evolution through hybridization and polyploidy, though natural hybrids are quite rare in the family. The results of hybridization experiments strongly support hypotheses involving reticulation in the *Sedoideae*, as crossability appears to have been widely retained within this group (UHL, 1992; 't HART, 1978).

Hybridization experiments in Eurasian *Sedum* L. ('T HART, 1978, 1991) showed that following hybridization allopolyploidy can be easily achieved through a spontaneous increase of the production of unreduced gametes in hybrids. Thus in a series of hybridization experiments the allopolyploid origin of the polyploid *S. rupestre* L. subsp. *rupestre* ($2n=112$; $x=12+16$) could be demonstrated through synthesis of the taxon from its alleged parents ('t HART & al., 1993). Similarly, in the polyploid complex of the annual *S. rubens* L. relationships could be demonstrated between the East Mediterranean, tetraploid ($2n=20$) forms and the widely distributed, Eurasian, highly polyploid cytotypes ($2n=40, 60, 80, 100$), which differ conspicuously in flower morphology ('T HART & ALPINAR, 1991).

Positive results of hybridization experiments are quite frequently used in biosystematic studies to infer phylogenetic relationships, although crossability is intrinsically a plesiomorphic character. Crossability can be used, however, as a rough estimate of genetic distances in systematic and phylogenetic studies. Comparison of the results of hybridization experiments ('T HART, 1978, 1991) and genetic distances based on chloroplast DNA restriction site variation of a large number of Eurasian *Sedoideae* (VAN HAM, 1994) shows that the relation between crossability and genetic distance is complex and affected by several species specific, biological factors. In general, however, crossability is a good indication of close (phylogenetic) relationships in the *Sedoideae*.

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Address of the author:

Dr. Henk 't Hart, Department of Plant Ecology and Evolutionary Biology, Utrecht University, Padualaan 8, 3484 CH Utrecht, The Netherlands.